

## Telecommuting Patterns and Trends in the Pioneer Valley



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## **I. INTRODUCTION**

In an online Commuter Survey open to the public from June, 2010 to June, 2011, the Pioneer Valley Planning Commission invited residents and employees of Hampden and Hampshire Counties to answer 20 multiple choice questions regarding their home-to-work/work-to-home commutes. The survey specifically addressed residents and employees who telecommute to work, an option which is expected to become increasingly prevalent as gas prices increase and residents adjust their lifestyles to adapt to the various effects of climate change. Telecommuting is defined as working from a “home base” and using any mode of telecommunication such as computer, phone, fax, social networking tools, etc. to connect with clients, colleagues, and offices. As such, telecommuting reduces or eliminates the need to travel to a traditional office environment.

Data collected from survey responses provides a picture of the telecommuter activity patterns in our region. The survey inquired about trip characteristics as well as demographic information related to the employer. Questions were asked about the average commute duration and distance. Participants were asked whether their employer offered telecommuting and whether it was required. Telecommuters were asked about the main reason they telecommuted. Regarding a telecommute day, telecommuters were asked what tools they used, whether the work duration was similar to a day at the office, and if they had similar start and end times. To further assess travel behaviors of telecommuters, they were asked about the frequency, type, and mode of choice for trips conducted on telecommute day. Demographic data included employment type, marital status, parental status, gender, and age. The survey took approximately five minutes to complete and is referenced in Appendix A. This study is part of the Regional Congestion Management Process, which identifies, evaluates, and implements transportation performance measures that enhance the safety and efficiency of the movement of people, goods, and information.

## **II. DATA COLLECTION**

In addition to announcing the availability of the survey to the regional media, the survey was posted on the Pioneer Valley Planning Commission’s (PVPC) website ([www.pvpc.org](http://www.pvpc.org)) and an invitation was sent to a contact at the MassMutual Center, a major employer in the region, with a request that they inform and encourage employees to participate. Survey responses were collected from June 15, 2010 until June 14, 2011. Over the course of a year, a small percentage of employees in the region had taken the survey. Out of these 58 participants, 16 were telecommuters. This survey sample is quite small to draw definitive conclusions, yet collected responses may give an initial indicator to the status of telecommuting in the region. Thus, it would

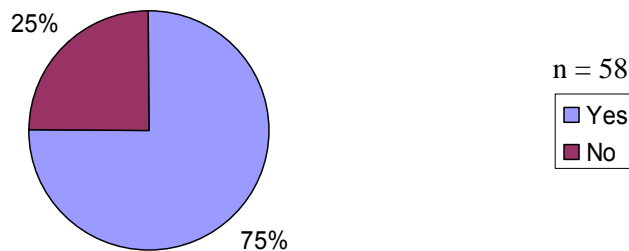
be beneficial to obtain a wider pool of participants in the future by sending this survey to more employers in the region and actively encouraging them to distribute it among their employees.

### III. DATA ANALYSIS

According to participants' responses, it appears that more than half of the employers did not offer telecommuting as an option to their employees. Over a third of those surveyed had the option to telecommute. Only one respondent was required to telecommute to work by their employer. Most employees will take advantage of a telecommuting option when it is offered (Figure 1).

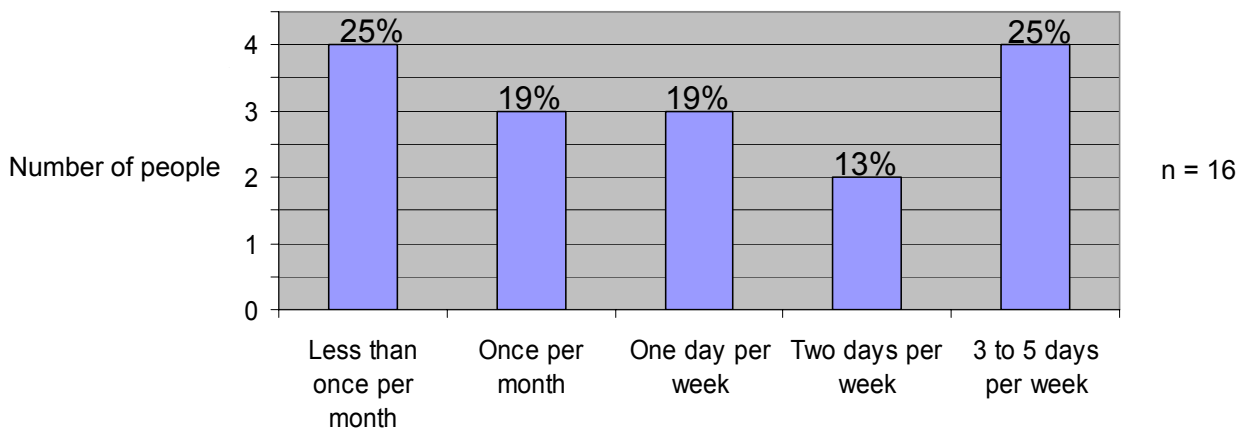
Employees who request to work from home may have to present a proposal to their employers making the case that telecommuting will be beneficial to the company, increase productivity and reduce costs. On the other hand, employers can offer telecommuting as an incentive and component of the employees' benefits package.

**Figure 1: Employees Who Telecommute When it is Offered as an Option**



Respondents who take advantage of the telecommuting option differ in how often they telecommute. A quarter of participants telecommutes less than once per month, almost a fifth telecommutes once per month, almost a fifth telecommutes once per week, over a tenth telecommutes two days per week, and another quarter telecommutes 3 to 5 days per week (Figure 2). Variability in telecommuting habits indicates the ability of offices to adapt to this work model.

**Figure 2: Telecommuter Habits**



According to respondents, the main reasons to opt for telecommuting are, above all, convenience (65%) followed by transportation hazards posed by inclement weather (47%). Only a quarter of participants included savings on travel costs as a reason to telecommute. With gas prices projected to progressively rise, it is possible that savings on travel costs will become increasingly significant as a deciding factor to telecommute. Some participants also responded that they telecommute to meetings outside the office (18%). A small percentage of telecommuters do so to supervise children at home (12%). Some may expect that women, as traditional caregivers/homemakers, would be more likely to telecommute to work in order to help balance roles at home and work. The gender split for telecommuters, however, was fairly even, with a little under half of telecommuters being female and a little over half being male (46.7%, 53.3%). The majority of telecommuters are married (67.4%); a majority also works full-time (80%); and just over half of the respondents have children (52.3%). While it might have been similarly predicted that many of the telecommuters with children would be staying home to supervise younger children, only about a quarter of participants reported having children younger than six. This is consistent with the low percentage of participants who factor supervision of children as a main reason to telecommute. However, those who do factor supervision of children into their decision to telecommute are all women. Figure 3 below breaks down participants' reasons to telecommute by gender. More men telecommuted for convenience as well as due to weather conditions than women. Both men and women were equal in the degree to which they factored saving on travel time, and both genders were somewhat similar in their consideration of travel costs (Figure 3). The complete set of responses cross tabulated by gender is available in Appendix C.

**Figure 3: Reasons to Telecommute by Gender**

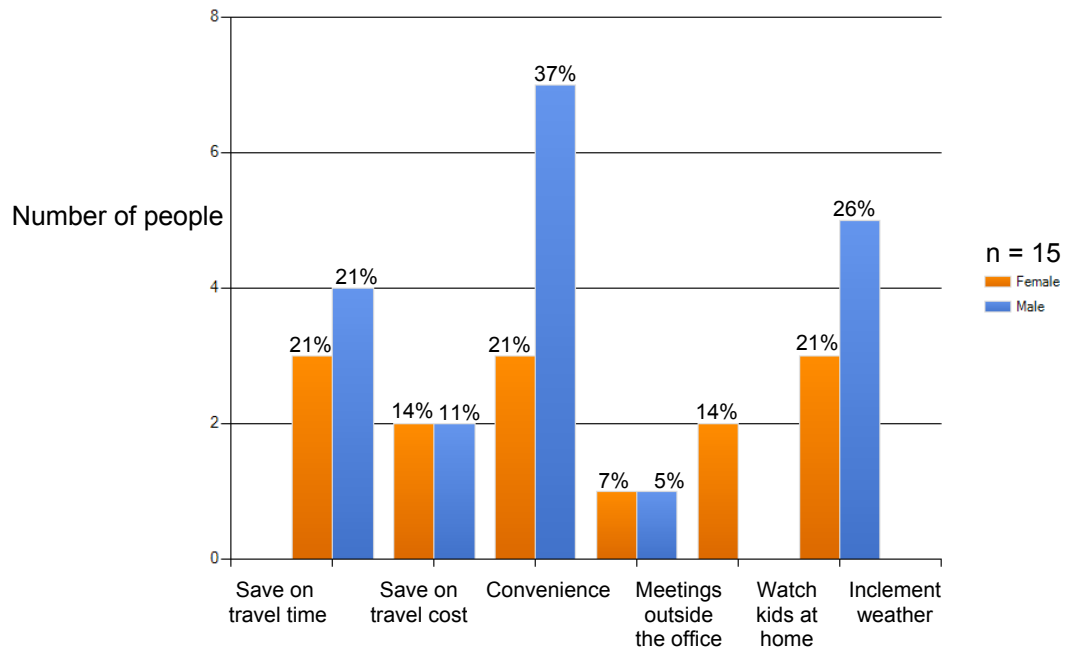
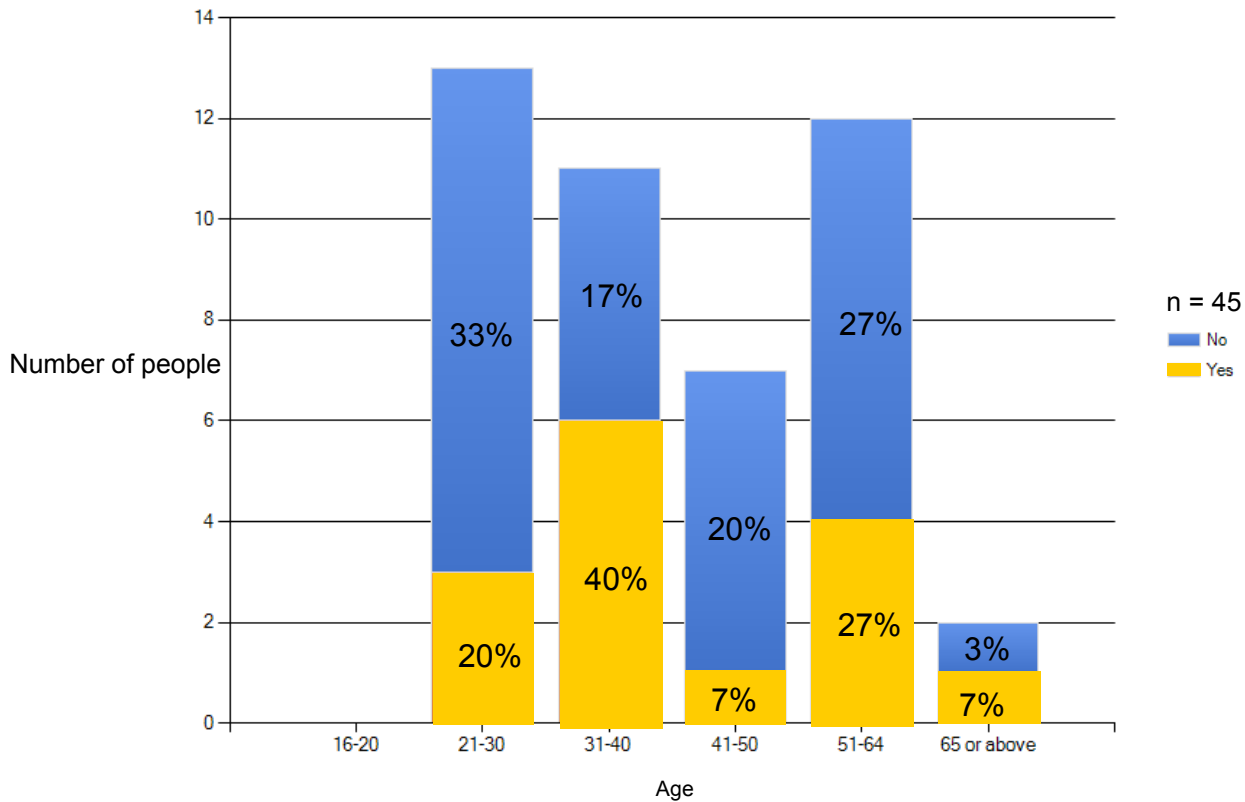


Figure 4 goes on to illustrate a breakdown of telecommuters and non-telecommuters by age. Overall, the 31 to 40 age group had the most telecommuters (40%), followed by the 51 to 64 age group with over a quarter. The 21 to 30 age group totaled a fifth of telecommuters surveyed, while the 41 to 50 and 65 or above age ranges each held the lowest percentage of telecommuters. None of the survey participants were in the 16 to 20 age group. Out of the six age groups, a greater proportion of middle-aged telecommuters responded that convenience was a major reason to work from home. This could be due to family obligations and home responsibilities. Such responsibilities may not be of much concern to younger and older telecommuters. Telecommuters from the younger age groups could perhaps have had greater exposure to technological tools and applications in their education. As a result, they may be more technically savvy, a critical asset for telecommuters. The age group represented most in the survey by telecommuters and non-telecommuters collectively is 21 to 30 (29%), followed by 51 to 64 (27%).

**Figure 4: Telecommuters and Non-telecommuters by Age**

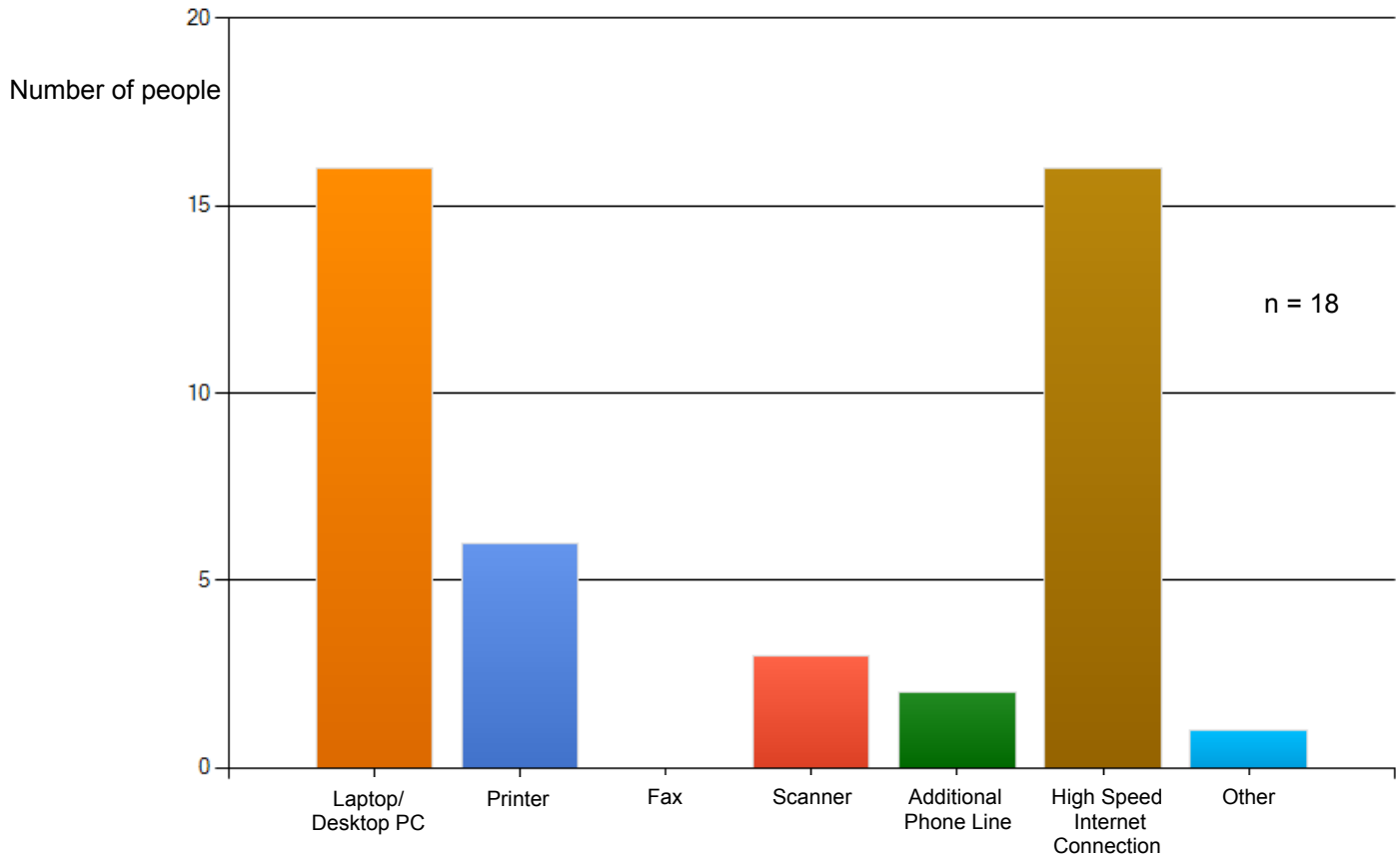


Some employees have the ability to telecommute because their type of work can be undertaken independently and does not require access to complex machinery. Working in a team, several telecommuters could still interact with colleagues via the Internet through email, voice over the internet, video teleconferencing, etc. It is possible that employees who do not take advantage of virtual commute options may be unfamiliar with certain computer applications that facilitate business work virtually. Some workers may not have the means to supply tools and equipment needed to work from home, if their employer does not provide it. A computer is usually required for telecommuting, and all telecommuters reported using one for their work at home. Almost all participants reported using a high speed Internet connection, as well, and many used a printer and scanner. Some telecommuters needed an additional phone line (Figure 5).

With employment opportunities in the manufacturing sector decreasing and emphasis on technology and social networking increasing, the State of Massachusetts has identified broadband network extension as key in progressing economically. In 2010, \$45.5 million from the American Recovery and Reinvestment Act was granted to Massachusetts along with \$26.2 million matched by the State to lay down public fiber network in offline communities of western and north central Massachusetts. The project is being led by Massachusetts Broadband Initiative,

and construction began in July of 2011. The expansion of broadband possibilities will diminish the “digital divide” by advancing the efficiency and implementation of telecommuting options for workers and employment offices.

**Figure 5: Tools and Equipment Used by Telecommuters**

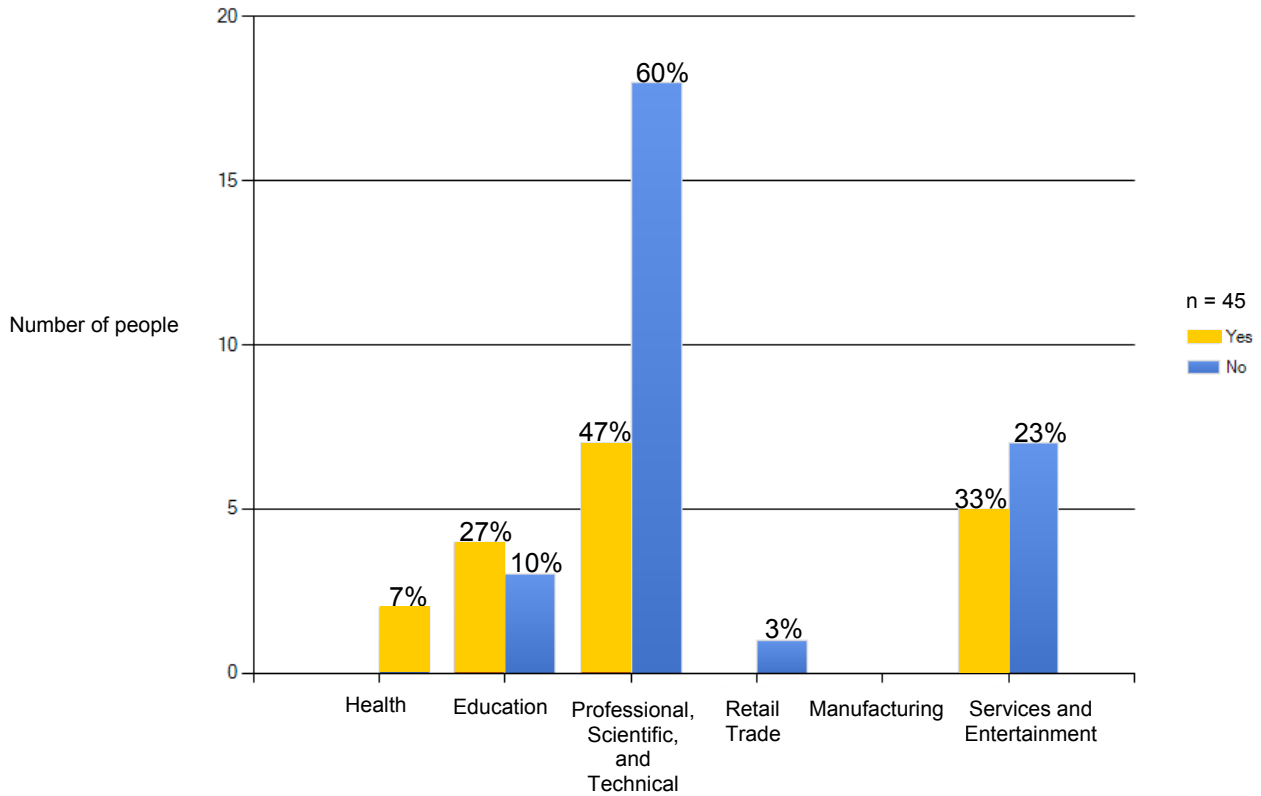


Of the workers surveyed, the majority identified their employment type as in the category of Professional, Scientific, and Technical Services (Figure 6). A greater proportion of workers in this category are expected to telecommute, as their type of work can be accomplished in a virtual setting. It is interesting to note that even though this employment category had the highest number of telecommuters it also had the highest number of non-telecommuters (47%) compared to the rest of the employment categories. Other employment types such as Retail Trade, Manufacturing, Healthcare, and Social Assistance are often dependent upon spatial proximity between worker and equipment/machinery or between worker and consumer/patient. The initial data confirms this, showing that these employment categories had no telecommuters. With an increasing number of educational institutes starting to offer online classes and distant learning options to non-traditional students in higher education, teachers of such classes have the flexibility to telecommute; it is probable that this applies to the respondents who telecommuted



from the Education employment category (27%). The survey data shows that more than half (56%) of all respondents, both telecommuting and non-telecommuting, were from the Professional, Scientific, and Technical Services (Appendix B). This indicates the potential for greater telecommuting numbers by this employment sector, which represents a significant portion of jobs in an increasingly digitized, information-based economy.

**Figure 6: Telecommuters and Non-telecommuters by Employment Category**



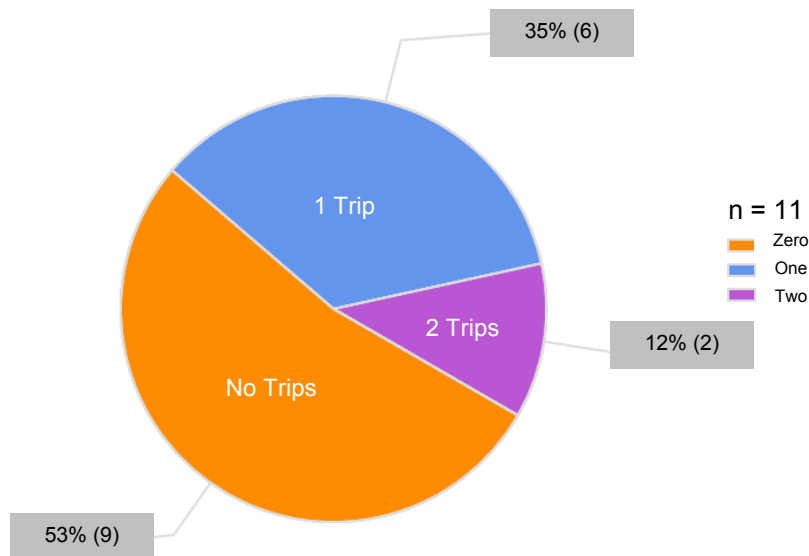
More than half of the telecommuters did not take any trips during their telecommute day, while a little more than a third took one trip and about 12% took two trips (Figure 7). None reported taking more than two trips. On telecommute day, shopping trips constituted the highest number of trips taken (39%). Almost a fourth of trips were work-related, 15% of trips were taken to pick-up/drop-off someone, 15% of trips were for personal business or medical needs, and a small percentage of trips (8%) were taken for recreation and social activities (Figure 8).

A major reason telecommuting is encouraged is to reduce the number of single occupancy vehicles (SOV) on the roads and thereby diminish congestion and the region's carbon footprint, for which the transportation sector is a major contributor. Data on mode share from the 2000 Census was cited in the 2007 Update of the Regional Transportation Plan, showing that nearly

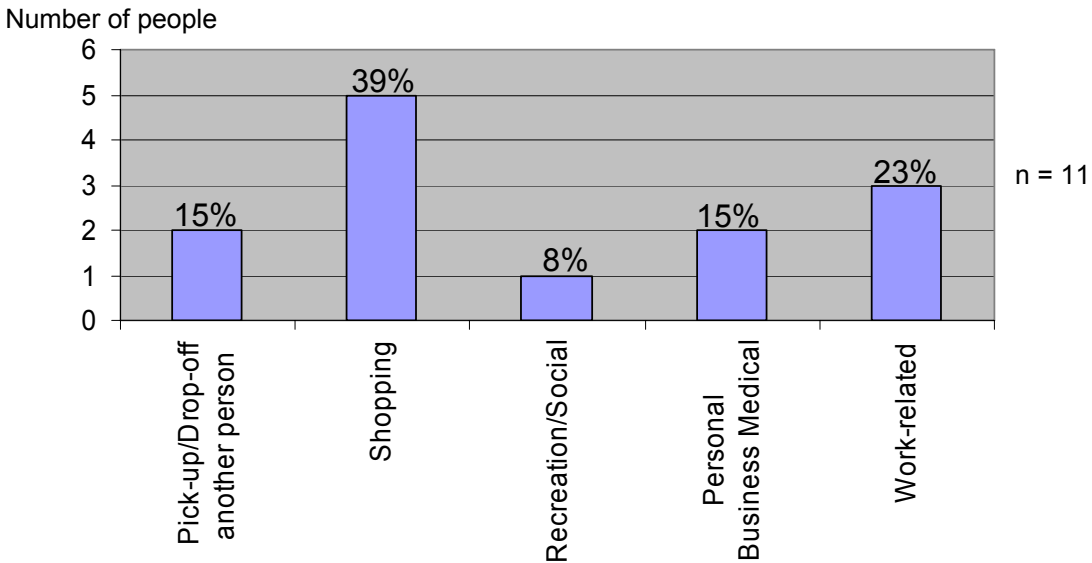
80% of all work trips in the Pioneer Valley were made via single occupancy vehicles; of the remaining 20% of travelers who did not drive alone almost half chose to carpool to work. According to the Regional Transportation Plan, telecommuters consisted of only 2.7% of total commuters, although it was projected that this percentage may increase as the region's telecommunications network expands.

The latest Regional Transportation Plan still indicates a “heavy regional tilt” toward SOVs, citing the 2006-2008 American Community Survey (ACS) which provides the most recent information on mode share. The ACS found that “81% of commuters in the Pioneer Valley region drive alone to work, significantly above the statewide average of 73%. Public transportation was significantly underused, with only 1.9% of commuters in the region traveling by transit compared to almost 9% statewide.” The percentage of Pioneer Valley workers commuting via private auto has increased since the 2000 Census. One of the emphasis areas in the 2012 Update to the Regional Transportation Plan (RTP) is sustainability. Transportation issues related to sustainability must be actively pursued with the priorities for our regional transportation network defined accordingly. Legislation including the Global Warming Solutions Act, cited in this updated RTP, requires Massachusetts to reduce economy-wide greenhouse gas (GHG) emissions 10% to 25% below 1990 levels by 2020 and 80% below 1990 levels by 2050. According to the 2012 RTP, the transportation sector is the largest GHG emitter, producing 31% of 1990 emissions and projected to produce 38% of 2020 emissions. Advancing telecommuting options in the region is one of the strategies identified to accomplish this goal.

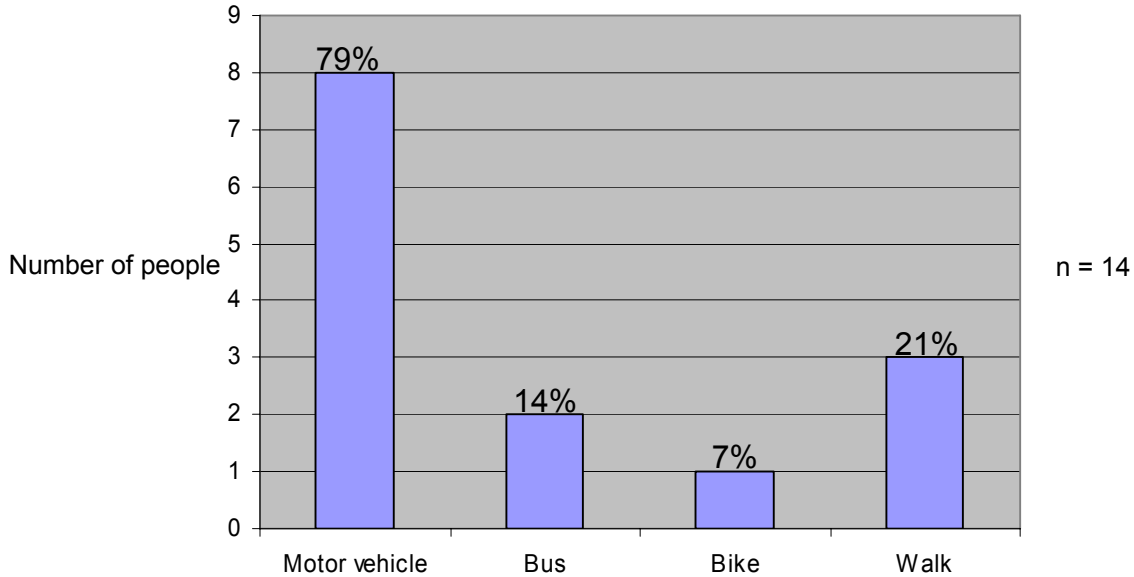
**Figure 7: Trips Taken on Telecommute Day**



**Figure 8: Types of Trips Taken on Telecommute Day**



**Figure 9: Mode of Choice for Trips by Telecommuters on Telecommute Day**

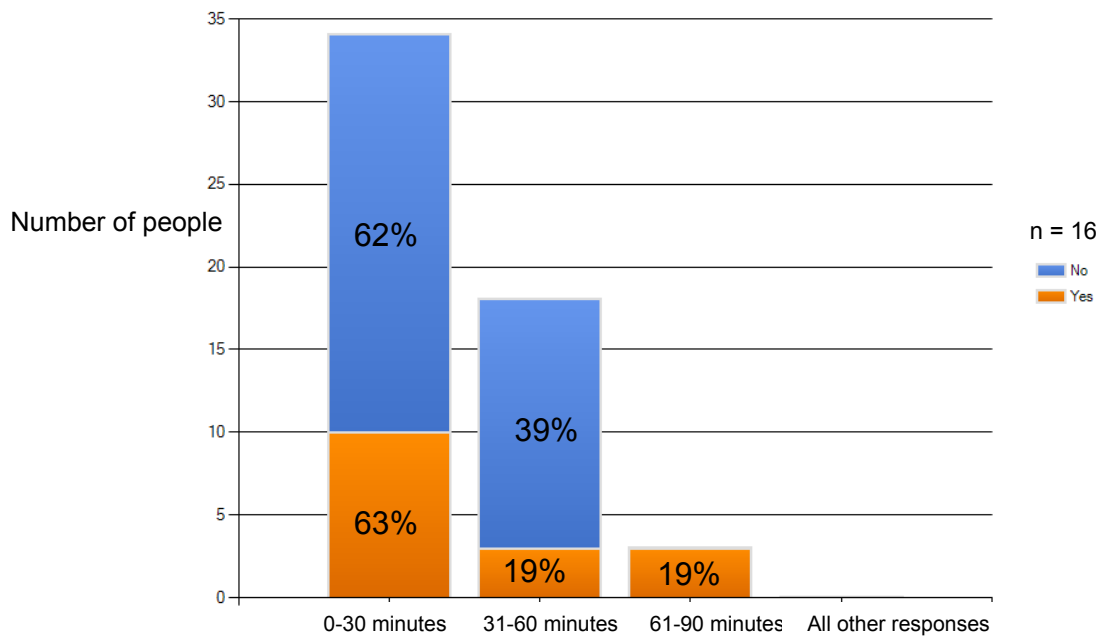


On a telecommute day, the majority of participants took trips using a motor vehicle (78.6%), while only a little over a fifth (21%) walked, 14% took the bus, and 7% biked to their destination (Figure 9). The prevalence of trips taken via motor vehicle is an outcome of traffic networks and policy decisions giving priority to the automobile. Consequently, transit, bicycle and pedestrian options have become secondary, tertiary or barely viable as an option in a number of municipalities.

Automobile-centered policy decisions and transportation improvements would undercut demand and funding for infrastructure accommodating other modes of travel, creating a perception of inconvenience around alternative modes of travel. Telecommuters may be more likely to take trips using a mode of travel other than the automobile if public transit services and access were expanded. Trips taken by telecommuters with generally flexible work schedules are likely to be shorter and conducted during non-peak traffic hours to local destinations. The overall effect of this change in travel behavior would likely decrease, even by a small percentage, the number of vehicles driving on currently congested roadways during peak hours of traffic.

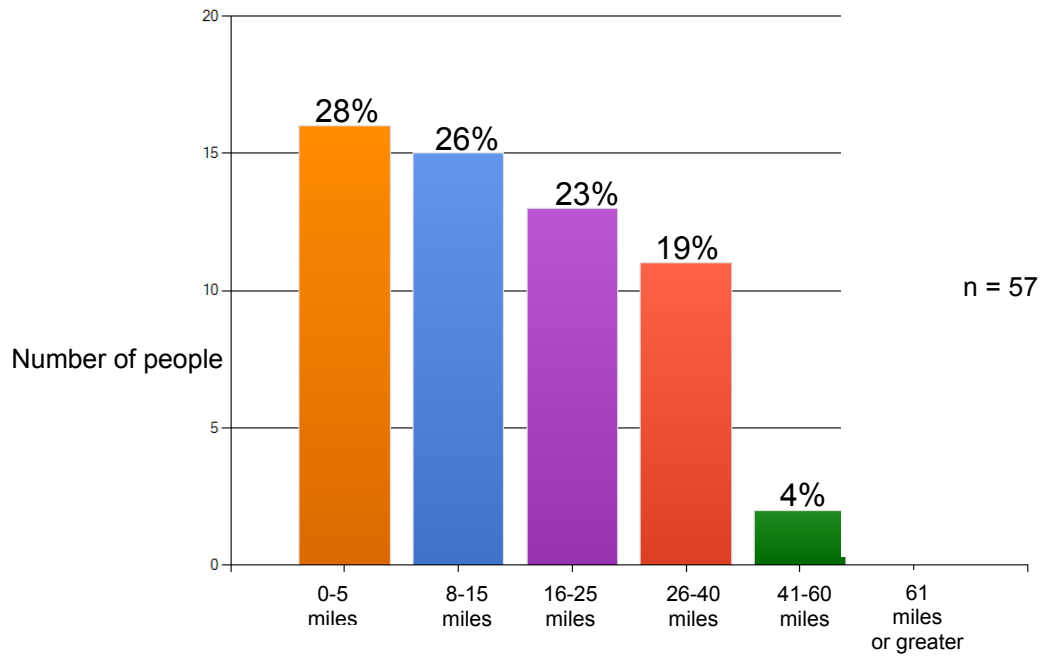
The majority of respondents (63%) had a commute time of less than half an hour between home and work; and 19% reported a 31 to 60 minute journey; and the same percentage reported a commute beyond one hour (Figure 10).

**Figure 10: Average Commute Times for Telecommuters and Non-telecommuters**



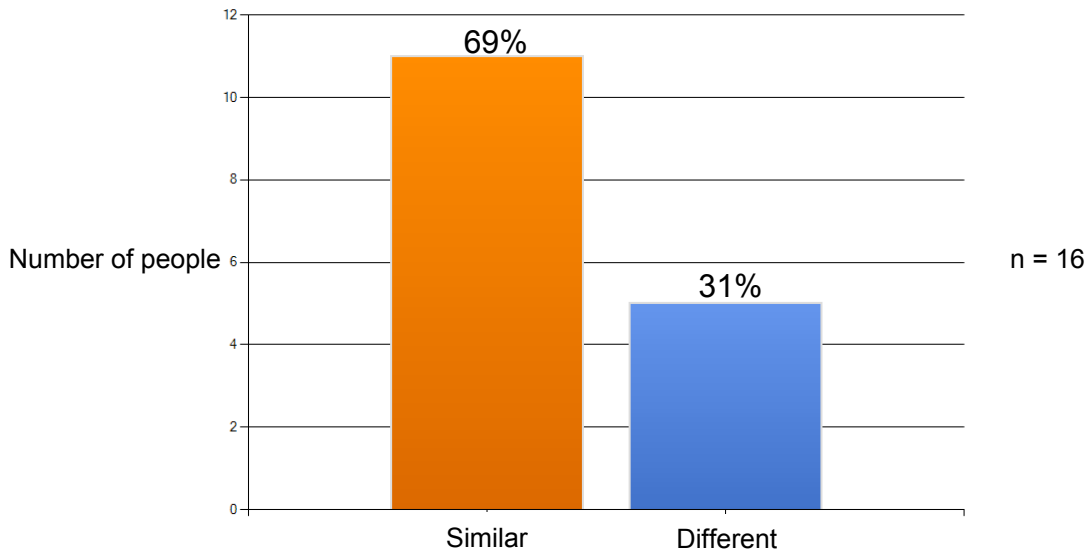
Commute distance varied fairly evenly between trips within the 40 mile range, with the highest number of participants (29%) reporting a 0 to 5 mile commute (Figure 11). A very small percentage of participants (4%) commuted over 40 miles. If the percentage of workers in the Hampden and Hampshire Counties who are able to take advantage of a telecommute option increases, marked savings in fuel costs and fuel consumption would be expected.

**Figure 11: Average Commute Distance Between Home and Work**

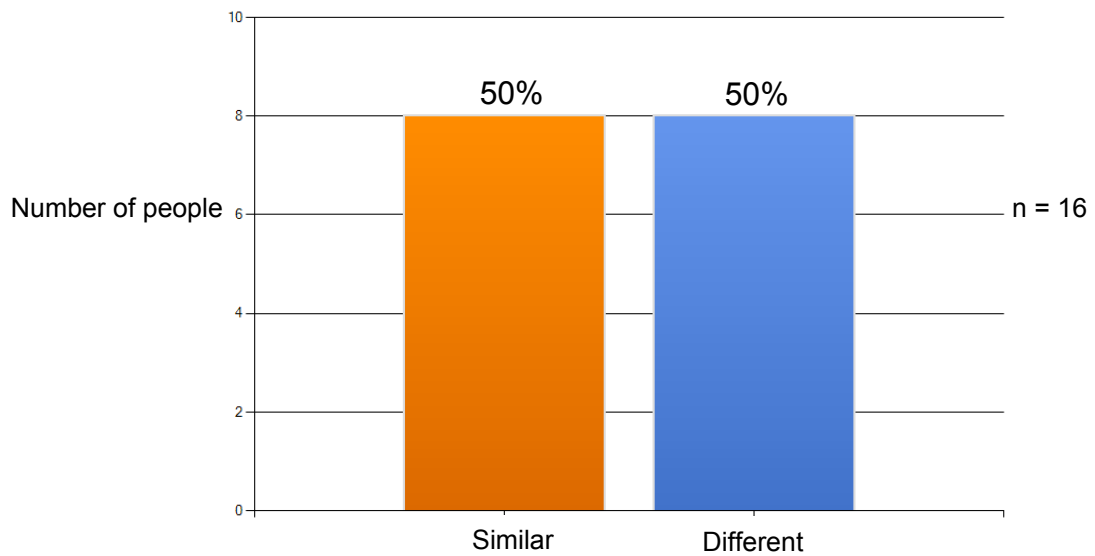


Comparing work duration at the office versus telecommuting, most respondents reported a similarity between the two locations (69%), and less than a third reported a difference in duration (31%) (Figure 12). When asked whether there was a difference between start and end times for a regular work day and a telecommute day, telecommuters' answers showed a complete split: half reported similar work start and end times, and the other half reported otherwise (Figure 13). Differences in start and end times can be explained by fewer restrictions on employees' time and access to work, as the time normally devoted to travel between work and home is taken out of the daily schedule. As a result, telecommuters have more freedom to choose their hours of work, adapting personal needs and family obligations to work responsibilities.

**Figure 12: Comparison between Work Duration on Regular Work Day and Telecommute Day**



**Figure 13: Comparison between Work Start and End Times for Regular Work Day and Telecommute Day**



#### IV. SUMMARY

The following are key observations and recommendations based on the survey results and regional trends.

- Employees will take advantage of a telecommuting option when companies institute such programs.
  - i. Seventy-five percent of respondents chose to telecommute when it was offered by their employers.
- Companies that are flexible, creative and embracing of new technologies will be better able to implement telecommuting programs.
  - i. Telecommuting participants used a laptop or desktop PC and high speed Internet connection to telecommute.
  - ii. Inclusion of technical training that enables telecommuters to engage in business work virtually would maximize employee productivity.
- Telecommuting may allow greater balance and harmonization of work-home obligations and needs.
  - i. The majority of telecommuters said that convenience was their main reason to telecommute.
- Greater numbers of telecommuters making fewer trips or taking shorter trips during the day could decrease the number of vehicles on the road and improve roadway safety during congested periods or inclement weather and hazardous circumstances.
  - i. Almost half of participants said that avoiding inclement weather was a main reason to telecommute.
- Telecommuting programs may or may not be sensitive to an employee's ability to afford the tools and equipment necessary to work from home.
  - i. While some employers fund and install the equipment necessary for an employee to telecommute, other businesses may choose not to do so or may not have the capital necessary to do so.
- Expanded transit services would encourage telecommuters to leave their automobiles home for work-related as well as non work-related trips during telecommute days.
  - i. Mode share data from the 2006 to 2008 American Community Survey shows that 1.9% of Pioneer Valley commuters using public transit to get to work compared to 81.1% using private autos.
  - ii. The percentages of commuters driving alone in the Hampden and Hampshire Counties—83.8% and 73.3% respectively—is above the statewide percentage of
  - iii. The percentages of commuters using public transit to travel to work in the Hampden and Hampshire Counties—1.9% and 1.7% respectively—are well below the statewide percentage of 8.9%.
  - iv. The 2012 RTP identifies securing “adequate funding for a balanced regional transportation system” as a goal and states the following:
    - “Travel in the Pioneer Valley region is dominated by automobile travel. Work trips are characterized by a high percentage of people that choose to drive alone to work,

which contributes to both congestion and air quality issues. Lack of sufficient funding for public transit and a viable regional ridesharing program contribute to people choosing to rely on the automobile. Lack of connectivity for bicycles and pedestrians require people to use their car for shorter trips that could otherwise be made by bike or on foot.”

## **V. CONCLUSION**

The benefits of telecommuting are wide-ranging and include: more efficient use of time; increased flexibility in one’s personal daily schedule; decreased fuel consumption; and savings on fuel costs. As more employers and employees become aware of the benefits of telecommuting, offices may become more creative in how they offer this as an option for workers. There is a possibility that with advances in healthcare technologies and other employment sectors, telecommuting could become an option to differing degrees for a greater number of people. In an age where the transfer of information and information technology are the basis of ‘creative economies,’ a telecommuting alternative has the potential to be implemented on a wider scale in the future. In our region the new Massachusetts Broadband Initiative will implement a public fiber optic network in western Massachusetts for communities that have not had access to broadband technology to provide opportunities for economic growth.

While the immediate personal and economic conveniences of telecommuting are obvious, it is also important for residents and employees to decrease their fuel consumption and for the ‘green’ objectives of a telecommuting option to be realized. In order to advance sustainability and energy efficiency initiatives and encourage telecommuting, it is essential for transit and public transportation networks to adequately service residents of a community and for community members to feel comfortable taking advantage of these services. The 2012 RTP Update states that the Pioneer Valley Transportation Authority (PVTA) “has considered extending the hours of service on the primary routes,” namely in the Cities of Holyoke and Springfield, and “seeks to convert to community routes to provide more responsive service as a FlexVan route,” which uses smaller transit vehicles that are able to provide more responsive and customer focused service. Such changes will require state and federal funding, which must also go toward bus and facility repairs, investments in a fuel-efficient bus fleet, and improvements to the region’s Intelligent Transportation System (ITS), which emphasizes systemic efficiency measures such as real-time travel/schedule information for both drivers and passengers. As the number of telecommuters increases, transit, bike, and pedestrian services and infrastructure will maximize the feasibility and benefits of a work-from-home option.





## Appendix A: Survey Questionnaire and Results



Pioneer Valley Virtual Commuter Survey










1. What is your average commute time between home and work?			
		Response Percent	Response Count
0-30 minutes		58.6%	34
31-60 minutes		34.5%	20
61-90 minutes		5.2%	3
more than 90 minutes		1.7%	1
answered question			58
skipped question			0



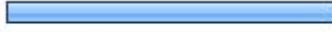


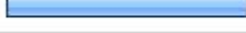
2. What is your average commute distance between home and work?			
		Response Percent	Response Count
0-5 miles		28.1%	16
6-15 miles		26.3%	15
16-25 miles		22.8%	13
26-40 miles		19.3%	11
41-60 miles		3.5%	2
61 miles or greater		0.0%	0
answered question			57
skipped question			1

3. Does your employer offer telecommuting?			
		Response Percent	Response Count
Yes		36.4%	20
No		63.6%	35
answered question			55
skipped question			3







4. Do you telecommute?			
		Response Percent	Response Count
Yes		29.1%	16
No		70.9%	39
answered question			55
skipped question			3

5. If yes, how often do you telecommute?			
		Response Percent	Response Count
Less than once per month		36.8%	7
Once a month		15.8%	3
One day a week		15.8%	3
Two days a week		10.5%	2
3 to 5 days a week		21.1%	4
answered question			19
skipped question			39



6. Telecommuting in your job is:			
		Response Percent	Response Count
Optional		95.8%	23
Required		4.2%	1
answered question			24
skipped question			34



7. The main reason you telecommute is to ... (select all that apply)			
		Response Percent	Response Count
Save on travel time		41.2%	7
Save on travel cost		23.5%	4
Convenience		64.7%	11
Meetings outside the office		17.6%	3
Watch kids at home		11.8%	2
Inclement weather		47.1%	8
answered question			17
skipped question			41




### 8. Tools you use in telecommuting include:

		Response Percent	Response Count
Laptop/ Desktop PC		100.0%	18
Printer		33.3%	6
Fax		0.0%	0
Scanner		16.7%	3
Additional Phone Line		11.1%	2
High Speed Internet Connection		88.9%	16
Other		5.6%	1
<b>answered question</b>			<b>18</b>
<b>skipped question</b>			<b>40</b>






### 9. Your work duration at the office versus telecommuting is:

		Response Percent	Response Count
Similar		57.9%	11
Different		42.1%	8
<b>answered question</b>			<b>19</b>
<b>skipped question</b>			<b>39</b>





10. Your work start time and end time at the office versus telecommuting are:			
		Response Percent	Response Count
Similar		44.4%	8
Different		55.6%	10
answered question			18
skipped question			40






11. On average, how many trips do you make during your telecommute day?			
		Response Percent	Response Count
Zero		52.9%	9
One		35.3%	6
Two		11.8%	2
Three or more		0.0%	0
answered question			17
skipped question			41



**12. The type of trips you make on your telecommute day include: (check all that apply)**



		Response Percent	Response Count
Pick-up/Drop-off another person		27.3%	3
<b>Shopping</b>		54.5%	6
Recreation/Social		18.2%	2
Personal Business/Medical		27.3%	3
Education		0.0%	0
Work-related		45.5%	5
<b>answered question</b>			<b>11</b>
<b>skipped question</b>			<b>47</b>



**13. Your mode of choice on telecommute day is**

		Response Percent	Response Count
<b>Motor vehicle</b>		78.6%	11
Bus		14.3%	2
Bike		7.1%	1
Walk		21.4%	3
<b>answered question</b>			<b>14</b>
<b>skipped question</b>			<b>44</b>

<b>14. Your Employment Category is:</b>			
		<b>Response Percent</b>	<b>Response Count</b>
Health Care and Social Assistance		4.4%	2
Educational Services		15.8%	7
Professional, Scientific, and Technical Services		55.6%	25
Retail Trade		2.2%	1
Manufacturing		0.0%	0
Other		26.7%	12
<b>answered question</b>			<b>45</b>
<b>skipped question</b>			<b>13</b>

<b>15. Your job is:</b>			
		<b>Response Percent</b>	<b>Response Count</b>
Full-time		80.0%	36
Part-time		20.0%	9
<b>answered question</b>			<b>45</b>
<b>skipped question</b>			<b>13</b>

16. Are you married?			
		Response Percent	Response Count
Yes		67.4%	29
No		32.6%	14
answered question			43
skipped question			15

17. Do you have a child?			
		Response Percent	Response Count
Yes		52.3%	23
No		47.7%	21
answered question			44
skipped question			14

18. Is your child less than 6 years old?			
		Response Percent	Response Count
Yes		25.0%	8
No		75.0%	24
answered question			32
skipped question			26



19. What is your gender?			
		Response Percent	Response Count
Female		53.3%	24
Male		46.7%	21
answered question			45
skipped question			13

20. What is your age group?			
		Response Percent	Response Count
16-20		0.0%	0
21-30		28.9%	13
31-40		24.4%	11
41-50		15.8%	7
51-64		26.7%	12
65 or above		4.4%	2
answered question			45
skipped question			13

## Appendix B: Telecommuter versus Non-telecommuter Responses

Pioneer Valley Virtual Commuter Survey



1. What is your average commute time between home and work?			
	Do you telecommute?		
	Yes	No	Response Totals
0-30 minutes	62.5% (10)	61.5% (24)	61.8% (34)
31-60 minutes	18.8% (3)	38.5% (15)	32.7% (18)
61-90 minutes	18.8% (3)	0.0% (0)	5.5% (3)
more than 90 minutes	0.0% (0)	0.0% (0)	0.0% (0)
<b>answered question</b>	<b>16</b>	<b>39</b>	<b>55</b>
		<b>skipped question</b>	<b>0</b>

<b>2. What is your average commute distance between home and work?</b>			
	<b>Do you telecommute?</b>		
	<b>Yes</b>	<b>No</b>	<b>Response Totals</b>
0-5 miles	37.5% (6)	26.3% (10)	29.6% (16)
6-15 miles	12.5% (2)	28.9% (11)	24.1% (13)
16-25 miles	12.5% (2)	28.9% (11)	24.1% (13)
26-40 miles	31.3% (5)	13.2% (5)	18.5% (10)
41-60 miles	6.3% (1)	2.8% (1)	3.7% (2)
61 miles or greater	0.0% (0)	0.0% (0)	0.0% (0)
<b>answered question</b>	<b>16</b>	<b>38</b>	<b>54</b>
<b>skipped question</b>			<b>1</b>

<b>3. Does your employer offer telecommuting?</b>			
	<b>Do you telecommute?</b>		
	<b>Yes</b>	<b>No</b>	<b>Response Totals</b>
Yes	93.8% (15)	12.8% (5)	36.4% (20)
No	6.3% (1)	87.2% (34)	63.6% (35)
<b>answered question</b>	<b>16</b>	<b>39</b>	<b>55</b>
<b>skipped question</b>			<b>0</b>

4. Do you telecommute?			
	Do you telecommute?		
	Yes	No	Response Totals
Yes	100.0% (16)	0.0% (0)	29.1% (16)
No	0.0% (0)	100.0% (39)	70.9% (39)
<b>answered question</b>	<b>16</b>	<b>39</b>	<b>55</b>
<b>skipped question</b>			<b>0</b>

5. If yes, how often do you telecommute?			
	Do you telecommute?		
	Yes	No	Response Totals
Less than once per month	25.0% (4)	100.0% (3)	36.8% (7)
Once a month	18.8% (3)	0.0% (0)	15.8% (3)
One day a week	18.8% (3)	0.0% (0)	15.8% (3)
Two days a week	12.5% (2)	0.0% (0)	10.5% (2)
3 to 5 days a week	25.0% (4)	0.0% (0)	21.1% (4)
<b>answered question</b>	<b>16</b>	<b>3</b>	<b>19</b>
<b>skipped question</b>			<b>36</b>

6. Telecommuting in your job is:			
	Do you telecommute?		
	Yes	No	Response Totals
Optional	93.8% (15)	100.0% (8)	95.8% (23)
Required	6.3% (1)	0.0% (0)	4.2% (1)
<b>answered question</b>	<b>16</b>	<b>8</b>	<b>24</b>
<b>skipped question</b>			<b>31</b>

7. The main reason you telecommute is to ... (select all that apply)			
	Do you telecommute?		
	Yes	No	Response Totals
Save on travel time	46.7% (7)	0.0% (0)	41.2% (7)
Save on travel cost	26.7% (4)	0.0% (0)	23.5% (4)
Convenience	73.3% (11)	0.0% (0)	64.7% (11)
Meetings outside the office	13.3% (2)	50.0% (1)	17.6% (3)
Watch kids at home	13.3% (2)	0.0% (0)	11.8% (2)
Inclement weather	46.7% (7)	50.0% (1)	47.1% (8)
<b>answered question</b>	<b>15</b>	<b>2</b>	<b>17</b>
<b>skipped question</b>			<b>38</b>

<b>8. Tools you use in telecommuting include:</b>			
	<b>Do you telecommute?</b>		
	<b>Yes</b>	<b>No</b>	<b>Response Totals</b>
Laptop/ Desktop PC	<b>100.0%</b> (16)	<b>100.0%</b> (2)	<b>100.0%</b> (18)
Printer	37.5% (6)	0.0% (0)	33.3% (6)
Fax	0.0% (0)	0.0% (0)	0.0% (0)
Scanner	18.8% (3)	0.0% (0)	16.7% (3)
Additional Phone Line	12.5% (2)	0.0% (0)	11.1% (2)
High Speed Internet Connection	<b>100.0%</b> (16)	0.0% (0)	88.9% (16)
Other	6.3% (1)	0.0% (0)	5.6% (1)
<b>answered question</b>	<b>16</b>	<b>2</b>	<b>18</b>
<b>skipped question</b>			<b>37</b>

9. Your work duration at the office versus telecommuting is:			
	Do you telecommute?		
	Yes	No	Response Totals
Similar	68.8% (11)	0.0% (0)	57.9% (11)
Different	31.3% (5)	100.0% (3)	42.1% (8)
<b>answered question</b>	<b>16</b>	<b>3</b>	<b>19</b>
<b>skipped question</b>			<b>36</b>

10. Your work start time and end time at the office versus telecommuting are:			
	Do you telecommute?		
	Yes	No	Response Totals
Similar	50.0% (8)	0.0% (0)	44.4% (8)
Different	50.0% (8)	100.0% (2)	55.6% (10)
<b>answered question</b>	<b>16</b>	<b>2</b>	<b>18</b>
<b>skipped question</b>			<b>37</b>

11. On average, how many trips do you make during your telecommute day?			
	Do you telecommute?		
	Yes	No	Response Totals
Zero	56.3% (9)	0.0% (0)	52.9% (9)
One	37.5% (6)	0.0% (0)	35.3% (6)
Two	6.3% (1)	100.0% (1)	11.8% (2)
Three or more	0.0% (0)	0.0% (0)	0.0% (0)
<b>answered question</b>	<b>16</b>	<b>1</b>	<b>17</b>
		<b>skipped question</b>	<b>38</b>



<b>12. The type of trips you make on your telecommute day include: (check all that apply)</b>			
	<b>Do you telecommute?</b>		
	<b>Yes</b>	<b>No</b>	<b>Response Totals</b>
Pick-up/Drop-off another person	22.2% (2)	50.0% (1)	27.3% (3)
Shopping	55.6% (5)	50.0% (1)	54.5% (6)
Recreation/Social	11.1% (1)	50.0% (1)	18.2% (2)
Personal Business/Medical	22.2% (2)	50.0% (1)	27.3% (3)
Education	0.0% (0)	0.0% (0)	0.0% (0)
Work-related	33.3% (3)	100.0% (2)	45.5% (5)
<b>answered question</b>	<b>9</b>	<b>2</b>	<b>11</b>
		<b>skipped question</b>	<b>44</b>

13. Your mode of choice on telecommute day is			
	Do you telecommute?		
	Yes	No	Response Totals
Motor vehicle	72.7% (8)	100.0% (3)	78.6% (11)
Bus	18.2% (2)	0.0% (0)	14.3% (2)
Bike	9.1% (1)	0.0% (0)	7.1% (1)
Walk	27.3% (3)	0.0% (0)	21.4% (3)
answered question	11	3	14
skipped question			41

14. Your Employment Category is:			
	Do you telecommute?		
	Yes	No	Response Totals
Health Care and Social Assistance	0.0% (0)	6.7% (2)	4.4% (2)
Educational Services	26.7% (4)	10.0% (3)	15.6% (7)
Professional, Scientific, and Technical Services	46.7% (7)	60.0% (18)	55.6% (25)
Retail Trade	0.0% (0)	3.3% (1)	2.2% (1)
Manufacturing	0.0% (0)	0.0% (0)	0.0% (0)
Other	33.3% (5)	23.3% (7)	26.7% (12)
<b>answered question</b>	<b>15</b>	<b>30</b>	<b>45</b>
<b>skipped question</b>			<b>10</b>

15. Your job is:			
	Do you telecommute?		
	Yes	No	Response Totals
Full-time	80.0% (12)	80.0% (24)	80.0% (36)
Part-time	20.0% (3)	20.0% (6)	20.0% (9)
<b>answered question</b>	<b>15</b>	<b>30</b>	<b>45</b>
<b>skipped question</b>			<b>10</b>

16. Are you married?			
	Do you telecommute?		
	Yes	No	Response Totals
Yes	57.1% (8)	72.4% (21)	67.4% (29)
No	42.9% (6)	27.6% (8)	32.6% (14)
<b>answered question</b>	<b>14</b>	<b>29</b>	<b>43</b>
<b>skipped question</b>			<b>12</b>

17. Do you have a child?			
	Do you telecommute?		
	Yes	No	Response Totals
Yes	42.9% (6)	56.7% (17)	52.3% (23)
No	57.1% (8)	43.3% (13)	47.7% (21)
<b>answered question</b>	<b>14</b>	<b>30</b>	<b>44</b>
<b>skipped question</b>			<b>11</b>

18. Is your child less than 6 years old?			
	Do you telecommute?		
	Yes	No	Response Totals
Yes	20.0% (2)	27.3% (6)	25.0% (8)
No	80.0% (8)	72.7% (16)	75.0% (24)
answered question	10	22	32
skipped question			23

19. What is your gender?			
	Do you telecommute?		
	Yes	No	Response Totals
Female	46.7% (7)	56.7% (17)	53.3% (24)
Male	53.3% (8)	43.3% (13)	46.7% (21)
answered question	15	30	45
skipped question			10

<b>20. What is your age group?</b>			
	<b>Do you telecommute?</b>		
	<b>Yes</b>	<b>No</b>	<b>Response Totals</b>
16-20	0.0% (0)	0.0% (0)	0.0% (0)
21-30	20.0% (3)	33.3% (10)	28.9% (13)
31-40	40.0% (6)	16.7% (5)	24.4% (11)
41-50	6.7% (1)	20.0% (6)	15.6% (7)
51-64	26.7% (4)	26.7% (8)	26.7% (12)
65 or above	6.7% (1)	3.3% (1)	4.4% (2)
<b>answered question</b>	<b>15</b>	<b>30</b>	<b>45</b>
	<b>skipped question</b>		<b>10</b>

## Appendix C: Responses by Gender

Pioneer Valley Virtual Commuter Survey



1. What is your average commute time between home and work?			
	What is your gender?		
	Female	Male	Response Totals
0-30 minutes	54.2% (13)	66.7% (14)	60.0% (27)
31-60 minutes	37.5% (9)	28.8% (6)	33.3% (15)
61-90 minutes	8.3% (2)	4.8% (1)	6.7% (3)
more than 90 minutes	0.0% (0)	0.0% (0)	0.0% (0)
<b>answered question</b>	<b>24</b>	<b>21</b>	<b>45</b>
	<b>skipped question</b>		<b>0</b>

2. What is your average commute distance between home and work?			
	What is your gender?		
	Female	Male	Response Totals
0-5 miles	25.0% (6)	38.1% (8)	31.1% (14)
6-15 miles	16.7% (4)	28.6% (6)	22.2% (10)
16-25 miles	20.8% (5)	23.8% (5)	22.2% (10)
26-40 miles	33.3% (8)	4.8% (1)	20.0% (9)
41-60 miles	4.2% (1)	4.8% (1)	4.4% (2)
61 miles or greater	0.0% (0)	0.0% (0)	0.0% (0)
<b>answered question</b>	<b>24</b>	<b>21</b>	<b>45</b>
<b>skipped question</b>			<b>0</b>

3. Does your employer offer telecommuting?			
	What is your gender?		
	Female	Male	Response Totals
Yes	33.3% (8)	47.6% (10)	40.0% (18)
No	66.7% (16)	52.4% (11)	60.0% (27)
<b>answered question</b>	<b>24</b>	<b>21</b>	<b>45</b>
<b>skipped question</b>			<b>0</b>



4. Do you telecommute?			
	What is your gender?		
	Female	Male	Response Totals
Yes	29.2% (7)	38.1% (8)	33.3% (15)
No	70.8% (17)	61.9% (13)	66.7% (30)
<b>answered question</b>	<b>24</b>	<b>21</b>	<b>45</b>
<b>skipped question</b>			<b>0</b>

5. If yes, how often do you telecommute?			
	What is your gender?		
	Female	Male	Response Totals
Less than once per month	37.5% (3)	25.0% (2)	31.3% (5)
Once a month	25.0% (2)	12.5% (1)	18.8% (3)
One day a week	25.0% (2)	12.5% (1)	18.8% (3)
Two days a week	12.5% (1)	0.0% (0)	6.3% (1)
3 to 5 days a week	0.0% (0)	50.0% (4)	25.0% (4)
<b>answered question</b>	<b>8</b>	<b>8</b>	<b>16</b>
<b>skipped question</b>			<b>29</b>

6. Telecommuting in your job is:			
	What is your gender?		
	Female	Male	Response Totals
Optional	100.0% (9)	90.9% (10)	95.0% (19)
Required	0.0% (0)	9.1% (1)	5.0% (1)
<b>answered question</b>	<b>9</b>	<b>11</b>	<b>20</b>
<b>skipped question</b>			<b>25</b>

7. The main reason you telecommute is to ... (select all that apply)			
	What is your gender?		
	Female	Male	Response Totals
Save on travel time	42.9% (3)	50.0% (4)	46.7% (7)
Save on travel cost	28.6% (2)	25.0% (2)	26.7% (4)
Convenience	42.9% (3)	87.5% (7)	66.7% (10)
Meetings outside the office	14.3% (1)	12.5% (1)	13.3% (2)
Watch kids at home	28.6% (2)	0.0% (0)	13.3% (2)
Inclement weather	42.9% (3)	62.5% (5)	53.3% (8)
<b>answered question</b>	<b>7</b>	<b>8</b>	<b>15</b>
<b>skipped question</b>			<b>30</b>

8. Tools you use in telecommuting include:			
	What is your gender?		
	Female	Male	Response Totals
Laptop/ Desktop PC	100.0% (8)	100.0% (8)	100.0% (16)
Printer	25.0% (2)	37.5% (3)	31.3% (5)
Fax	0.0% (0)	0.0% (0)	0.0% (0)
Scanner	12.5% (1)	25.0% (2)	18.8% (3)
Additional Phone Line	12.5% (1)	12.5% (1)	12.5% (2)
High Speed Internet Connection	87.5% (7)	100.0% (8)	93.8% (15)
Other	12.5% (1)	0.0% (0)	6.3% (1)
<b>answered question</b>	<b>8</b>	<b>8</b>	<b>16</b>
	<b>skipped question</b>		<b>29</b>

9. Your work duration at the office versus telecommuting is:			
	What is your gender?		
	Female	Male	Response Totals
Similar	50.0% (4)	66.7% (6)	58.8% (10)
Different	50.0% (4)	33.3% (3)	41.2% (7)
<b>answered question</b>	<b>8</b>	<b>9</b>	<b>17</b>
<b>skipped question</b>			<b>28</b>

10. Your work start time and end time at the office versus telecommuting are:			
	What is your gender?		
	Female	Male	Response Totals
Similar	37.5% (3)	50.0% (4)	43.8% (7)
Different	62.5% (5)	50.0% (4)	56.3% (9)
<b>answered question</b>	<b>8</b>	<b>8</b>	<b>16</b>
<b>skipped question</b>			<b>29</b>

11. On average, how many trips do you make during your telecommute day?			
	What is your gender?		
	Female	Male	Response Totals
Zero	62.5% (5)	37.5% (3)	50.0% (8)
One	12.5% (1)	62.5% (5)	37.5% (6)
Two	25.0% (2)	0.0% (0)	12.5% (2)
Three or more	0.0% (0)	0.0% (0)	0.0% (0)
<b>answered question</b>	<b>8</b>	<b>8</b>	<b>16</b>
	<b>skipped question</b>		<b>29</b>

<b>12. The type of trips you make on your telecommute day include: (check all that apply)</b>			
	<b>What is your gender?</b>		
	<b>Female</b>	<b>Male</b>	<b>Response Totals</b>
Pick-up/Drop-off another person	40.0% (2)	16.7% (1)	27.3% (3)
Shopping	40.0% (2)	66.7% (4)	54.5% (6)
Recreation/Social	20.0% (1)	16.7% (1)	18.2% (2)
Personal Business/Medical	20.0% (1)	33.3% (2)	27.3% (3)
Education	0.0% (0)	0.0% (0)	0.0% (0)
Work-related	60.0% (3)	33.3% (2)	45.5% (5)
<b>answered question</b>	<b>5</b>	<b>6</b>	<b>11</b>
<b>skipped question</b>			<b>34</b>

<b>13. Your mode of choice on telecommute day is</b>			
	<b>What is your gender?</b>		
	<b>Female</b>	<b>Male</b>	<b>Response Totals</b>
<b>Motor vehicle</b>	<b>100.0%</b> <b>(6)</b>	<b>71.4%</b> <b>(5)</b>	<b>84.6%</b> <b>(11)</b>
<b>Bus</b>	<b>0.0%</b> <b>(0)</b>	<b>28.6%</b> <b>(2)</b>	<b>15.4%</b> <b>(2)</b>
<b>Bike</b>	<b>16.7%</b> <b>(1)</b>	<b>0.0%</b> <b>(0)</b>	<b>7.7%</b> <b>(1)</b>
<b>Walk</b>	<b>33.3%</b> <b>(2)</b>	<b>0.0%</b> <b>(0)</b>	<b>15.4%</b> <b>(2)</b>
<b>answered question</b>	<b>6</b>	<b>7</b>	<b>13</b>
<b>skipped question</b>			<b>32</b>

14. Your Employment Category is:			
	What is your gender?		
	Female	Male	Response Totals
Health Care and Social Assistance	8.3% (2)	0.0% (0)	4.4% (2)
Educational Services	20.8% (5)	9.5% (2)	15.8% (7)
Professional, Scientific, and Technical Services	41.7% (10)	71.4% (15)	55.6% (25)
Retail Trade	0.0% (0)	4.8% (1)	2.2% (1)
Manufacturing	0.0% (0)	0.0% (0)	0.0% (0)
Other	33.3% (8)	19.0% (4)	26.7% (12)
<b>answered question</b>	<b>24</b>	<b>21</b>	<b>45</b>
<b>skipped question</b>			<b>0</b>

15. Your job is:			
	What is your gender?		
	Female	Male	Response Totals
Full-time	83.3% (20)	76.2% (16)	80.0% (36)
Part-time	16.7% (4)	23.8% (5)	20.0% (9)
<b>answered question</b>	<b>24</b>	<b>21</b>	<b>45</b>
<b>skipped question</b>			<b>0</b>



16. Are you married?			
	What is your gender?		
	Female	Male	Response Totals
Yes	65.2% (15)	70.0% (14)	67.4% (29)
No	34.8% (8)	30.0% (6)	32.6% (14)
<b>answered question</b>	<b>23</b>	<b>20</b>	<b>43</b>
<b>skipped question</b>			<b>2</b>

17. Do you have a child?			
	What is your gender?		
	Female	Male	Response Totals
Yes	47.8% (11)	57.1% (12)	52.3% (23)
No	52.2% (12)	42.9% (9)	47.7% (21)
<b>answered question</b>	<b>23</b>	<b>21</b>	<b>44</b>
<b>skipped question</b>			<b>1</b>

18. Is your child less than 6 years old?			
	What is your gender?		
	Female	Male	Response Totals
Yes	26.7% (4)	23.5% (4)	25.0% (8)
No	73.3% (11)	76.5% (13)	75.0% (24)
answered question	15	17	32
skipped question			13

19. What is your gender?			
	What is your gender?		
	Female	Male	Response Totals
Female	100.0% (24)	0.0% (0)	53.3% (24)
Male	0.0% (0)	100.0% (21)	46.7% (21)
answered question	24	21	45
skipped question			0

20. What is your age group?			
	What is your gender?		
	Female	Male	Response Totals
16-20	0.0% (0)	0.0% (0)	0.0% (0)
21-30	25.0% (6)	33.3% (7)	28.9% (13)
31-40	29.2% (7)	19.0% (4)	24.4% (11)
41-50	12.5% (3)	19.0% (4)	15.8% (7)
51-64	25.0% (6)	28.8% (6)	26.7% (12)
65 or above	8.3% (2)	0.0% (0)	4.4% (2)
<b>answered question</b>	<b>24</b>	<b>21</b>	<b>45</b>
	<b>skipped question</b>		<b>0</b>